REMARKS

Claims 1 and 3-35 are pending in the application and stand rejected. In the present response, claims 1 and 3-35 have been amended to correct informalities. Reconsideration and reexamination of the pending claims is respectfully requested in view of the present amendments and remarks.

In the Specification

The Office Action has objected to the specification because some of the references incorporated by reference are not U.S. patents or U.S. patent publications. In order to expedite allowance of the application and without restrictive intent, the incorporation by reference at paragraph [0041] of the specification has been removed.

In the Claims

A. The Rejections under 35 U.S.C. 112, Second Paragraph

Claims 1 and 33 have been rejected under 35 U.S.C. 112, second paragraph because of the term "pseudorandom."

Claims 1 and 33 recite a mathematical process characterized as a pseudorandom distribution. It is respectfully submitted that such a mathematical process is readily recognizable by a person skilled in the art, as evidenced, for example, by Paul E. Black, PSEUDO-RANDOM NUMBER GENERATOR, in Dictionary of Algorithms and Data Structures, and John Viega, PRACTICAL RANDOM NUMER GENERATION IN SOFTWARE, Virginia Tech, copies of which are enclosed herein. Based on the foregoing, the rejection under 35 U.S.C. 112, second paragraph is respectfully traversed.

B. The Rejections under 35 U.S.C. 103(a)

Claims 1, 3-9, 11-13, 23-25 and 30-35 have been rejected under 35 U.S.C. 103(a) over Buscema, SCIENTIFIC BACKGROUND OF DYNAMIC ADAPTIVE SYSTEMS ("Buscema") in view of Feldgajer, US 5,832,466 ("Feldgajer").

Claims 10, 14 and 21-22 have been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Lapointe, US 2003/0004906.

Claims 15-17 have been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Boden, US 5,708,774.

Claims 18-20 have been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Boden and of Burke, A GENETIC ALGORITHM TUTORIAL TOOL FOR NUMERICAL FUNCTION OPTIMISATION.

Claims 26 and 28 have been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Rose, US 2002/0178132.

Claim 27 has been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Breed, US 2003/0002690.

Claim 29 has been rejected under 35 U.S.C. 103(a) over Buscema in view of Feldgajer and further in view of Boden and Lapointe.

The rejections under 35 U.S.C. 103(a) are respectfully traversed at least for the following reasons.

With regard to claim 1, Buscema teaches that, in the supervised teaching and testing of an artificial neural network, the records of a database of known cases are subdivided in a training database and in a testing database, and that data are distributed between the testing and training databases randomly or pseudorandomly. Once such distribution is performed, the network that provides the best output distribution during testing in relation to known outputs, that is, the network that has the best fitness score, is selected as the best network.

A shortcoming of the method taught by Buscema is that such method may provide a network that may actually not result to be the most desirable network if different subdivisions of the records of the database were to be performed, because the Buscema method does not provide for protection against a potentially skewed distribution of the records.

The invention claimed in claim 1 utilizes the networks provided by Buscema as a starting point for generating a new generation of networks through a genetic or evolutionary algorithm. In general terms, the genetic algorithm provides a population of individuals having specific features (geni) that include some of the features of a father and some of the features of a mother that are members of a parent population. The genetic algorithm also includes rules related to the combination of the father with the mother and to the probability that a father and a mother may generate a new individual.

The Office Action has acknowledged that Buscema does not anticipate Applicant's claim

1 and has relied on Feldgajer to fill the deficiencies of Buscema.

Feldgajer is understood to teach a method for dynamic learning control in genetically enhanced back-propagation neural networks. In particular, Feldgajer is understood to teach the use of genetic algorithms not for generating the best training and testing databases of a network, but instead for determining the best architecture of the network itself. Within such architecture, each individual has different parameters of dynamic learning, which include parameters related to "learning rate" and "learning momentum" within a structure defined as "back propagation learning."

It is respectfully submitted that the invention claimed in claim 1 does not include a back propagation learning network, and that Feldgajer does not teach the distribution of database records in testing and training databases as geni, that is, as features of the different networks of a population. Instead, in the invention claimed in claim 1, the fitness scores of the neural networks of each population are determined not by parameters based on the back propagation learning taught by Feldgajer, but on records in the training and testing databases that are at least partially different from the records of the database of known cases.

More particularly, in the invention claimed in claim 1, the individuals (neural networks) of a child population are generated from the individuals of a parent population by combining the records in the training and testing databases of each of the father and mother networks, thereby obtaining a new network. The resulting child networks are the same as the parent networks from the standpoint of structure and dynamic learning parameters (when a back propagation-type network is considered), but each network is different because based on certain records of the database of known cases that are at least partially different from those in the training datasets of the father and mother networks.

The differences between Applicant's and Feldgajer's inventions are evidences, for instance, by the example described at col. 6, lines 60-65 of Feldgajer. In that example of criteria for supervised artificial neural network evaluation, in which "[a]n individual, considered to be the most successful, is used to provide artificial neural network topology and/or parameter settings for all individuals in a subsequent generation." Contrary to that, individuals of the new generation in Applicant's invention defined in claim 1 are different from one another because such individuals are generated from different fathers and mothers and, accordingly, are trained and tested with different training and testing databases, while the topology of the network is not modified.

Claims 3-9, 11-13, 23-25 and 30-35 are believed patentable over Buscema and Feldgajer for the same reasons as claim 1 and for the additional limitations contained therein.

Concerning claims 10, 14 and 21-22; 15-17; 18-20; and 26-29, it is believed that Lapointe, Boden, Burke, Rose and Breed fail to fill the deficiencies of Buscema and Feldgajer, rendering these claims also patentable over the cited references.

Therefore, the withdrawal of all rejections under 35 U.S.C. 103(a) is respectfully requested.

Conclusion

It is believed that all objections and rejections in the application have been addressed and that the application is now in condition for allowance. A notice to that effect is respectfully requested.

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Respectfully submitted,

/Franco A. Serafini/

Franco A. Serafini, Registration No. 52,207
Tel. (858) 456-2898

THEMIS INTELLECTUAL PROPERTY COUNSEL
7660 Fay Ave Ste H535
La Jolla, CA 92037